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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/926,012	10/24/2001	Yasuji Hiramatsu	212814US3PCT	9486

22850 7590 12/29/2004

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ALEXANDRIA, VA 22314

EXAMINER

PAIK, SANG YEOP

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/926,012

Applicant(s)

HIRAMATSU ET AL.

Examiner

Sang Y Paik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 27-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 27-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/27/04, 8/26/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 27-34, 36, 37, 39, 40, 41 and 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa (JP 11-040330) or Ito et al (US 6,072,162) in view of Tamagawa et al (US 5,777,838), Grimard et al (US 5,903,428) or Imai (US 5,738,165).

Furukawa or Ito shows a ceramic heater with a heating element pattern formed on the surface of a ceramic substrate. Furukawa further shows the ceramic substrate that is made of nitride or carbide ceramic with a sintering aid such as yttria at about 4 wt %, the through holes, the supporting pins, the heating element made of metal and metal oxide which further includes the claimed metal oxide materials such as lead oxide, zinc oxide, alumina, yttria and titania. Also, since metal oxides are added to the metal, the metal oxides comprise less than 100 parts by wt of the metal and metal oxides. Furukawa also shows a protective layer such as Au, Ag, Pd, Pt or Ni is provided over the heating element. Ito shows that the ceramic substrate is made of nitride ceramic with the heating element pattern which includes concentric circles. However, neither Furukawa nor Ito shows the convex body formed on the surface of ceramic substrate.

Tamagawa shows a convex body having a spherical or pyramidal shape having the height of 15-30 microns to provide a small point of contact to reduce the heat conduction between the wafer and the convex body. Grimard also shows a convex body having a spherical shape having

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the height of 5 to 350 microns to provide a minimal contact between the convex body and the wafer to maximize the heat transfer between the wafer and the ceramic heating surface. Imai also shows a convex body having a pyramidal shape having the height of 10-20 microns to show that the gap is provided to further provide a convection heat transfer between the wafer and the heater.

In view of Tamagawa et al, Grimard et al or Imai, it would have been obvious to one of ordinary skill in the art to adapt Furukawa or Ito with the convex body that is well known in the art to have the shapes of sphere or pyramid to support a wafer so that a more uniform convection heat can be provided to heat the wafer.

3. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa or Ito in view of Tamagawa, Grimard or Imai as applied to claims 1, 2, 27-34, 36, 37, 39, 40, 41 and 43-45 above, and further in view of Kobayashi et al (US 5,908,799).

Furukawa or Ito in view of Tamagawa, Grimard or Imai discloses the ceramic heater claimed except having the ceramic substrate having 200 to 5000 ppm of carbon.

Kobayashi et al shows a ceramic heater having a ceramic substrate made of aluminum nitride with 500 to 5000 ppm of carbon. Kobayashi et al teaches that adding such carbon provides the ceramic substrate with a blackish color while providing greater radiation heat capacity. In view of Kobayashi et al, it would have been obvious to one of ordinary skill in the art to adapt Furukawa or Ito, as modified by Tamagawa, Grimard or Imai, with 500 to 5000 ppm of carbon to the ceramic substrate to provide the ceramic heater with a blackish color that provides a high radiation heat capacity.

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4. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa or Ito in view of Tamagawa, Grimard or Imai as applied to claims 1, 2, 27-34, 36, 37, 39, 40, 41 and 43-45 above, and further in view of Nozaki et al (US 5,264,681).

Furukawa or Ito in view of Tamagawa, Grimard or Imai discloses the ceramic heater claimed except having the heating element pattern having a metal foil or metal wire.

Nozaki shows a ceramic heater with a heating element made of a conductive film or a metal wire. In view of Nozaki, it would have been obvious to one of ordinary skill in the art to provide the heating element in a metal foil in place of a conductive film as an alternative heating material that can also withstand a high heating temperature.

5. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa or Ito in view of Tamagawa, Grimard or Imai as applied to claims 1, 2, 27-34, 36, 37, 39, 40, 41 and 43-45 above, and further in view of Morita et al (US 5,118,983) or Tagashira et al (US 5,304,784).

Furukawa or Ito in view of Tamagawa, Grimard or Imai discloses the ceramic heater claimed except having the protective layer comprising a glass layer.

Morita and Tagashira show a protective coating such as a glass coating over an electrical resistance heating element. In view of Morita or Tagashira, it would have been obvious to one of ordinary skill in the art to provide a protective layer such as a glass layer to keep the heating element from peeling or cracking and also to prevent oxidation of the heating element.

Response to Arguments

6. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

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7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (9:00-4:00) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. R.

Sang Y Paik
Primary Examiner
Art Unit 3742

syp